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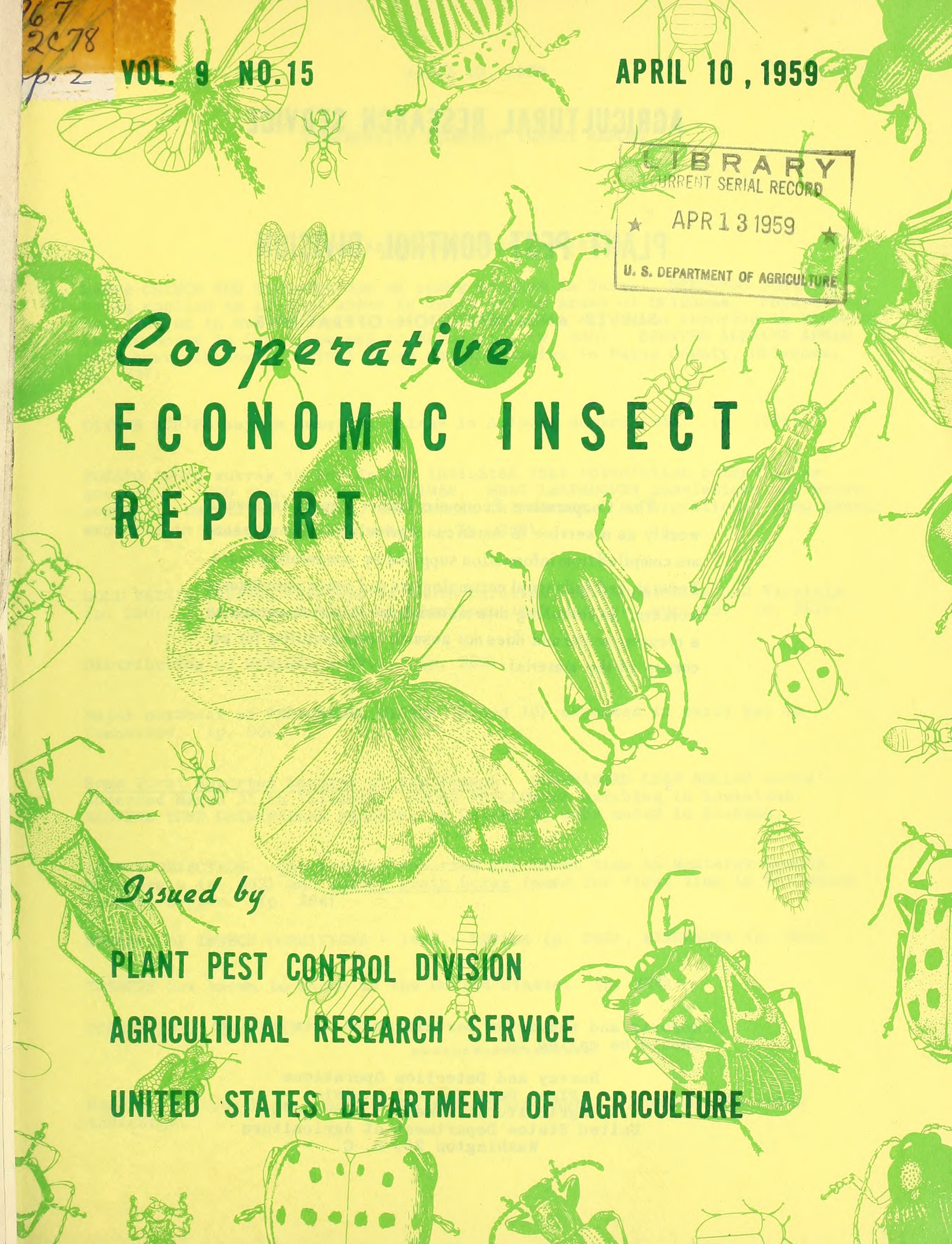

Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Survey and Detection Operations
Plant Pest Control Division
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Volume 9 April 10, 1959 Number 15

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

Heavy CHINCH BUG infestations on young sorghum in Texas. GREENBUG controls being applied in spotted areas in Texas and in areas of Oklahoma. Populations building up in New Mexico. First ARMYWORM moths of season reported in Missouri. Larvae noted in Louisiana and in Missouri. (p. 255). SPOTTED ALFALFA APHID very heavy in north central Texas and increasing in Payne County, Oklahoma. (p. 257).

CITRUS THRIPS may be heavy on citrus in Arizona during 1959. (p. 258).

POTATO APHID survey in New Jersey indicates that infestation potential is greater in 1959 than in 1957 and 1958. BEET LEAFHOPPER populations are below normal at Hermiston, Oregon, and low in California. No significant crop damage expected in California this season. (p. 259).

BOLL WEEVIL survival surveys in South Carolina, North Carolina and Virginia. (p. 260). Summary of these and previous 1959 survival surveys. (p. 261).

Distribution of HEMLOCK SAWFLY. (p. 262).

Major outbreak of PERIODICAL CICADA (Brood 19) expected in early May in Tennessee. (p. 264).

Some First Reported Records of the Season: RED-BANDED LEAF ROLLER moths observed March 31 in Illinois. PECAN PHYLLOXERA hatching in Louisiana. EASTERN TENT CATERPILLAR hatching in Delaware; webs noted in Alabama.

INSECT DETECTION: Olive scale reported for first time in Monterey County, California,(p. 263) and lesser grain borer found for first time in Tillamook County, Oregon. (p. 264).

SUMMARY OF INSECT CONDITIONS - 1958 - NEVADA (p. 266), MINNESOTA (p. 268).

INSECTS not known to occur in the United States. (p. 275).

CORRECTION. (p. 264).

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Reports in this issue are for the week ending April 3, unless otherwise indicated.

WEATHER BUREAU 30-DAY OUTLOOK

APRIL 1959

The Weather Bureau's 30-day outlook for April calls for temperatures to average below seasonal normals over the southeastern quarter of the Nation and also over the Pacific Northwest. Above normal temperatures are predicted for the Northern Plains, Great Lakes Region and the Far Southwest. In unspecified areas, about normal temperatures are in prospect. Rainfall is expected to exceed normal over the Southeast, the Pacific Northwest and the Central Plains. Subnormal amounts are anticipated over the southwestern quarter of the country as well as the Great Lakes Region. Elsewhere, about normal precipitation is in prospect.

Weather forecast given here is based on the official 30-day "Resume and Outlook", published twice a month by the Weather Bureau. You can subscribe through Superintendent of Documents, Washington 25, D. C. Price $4.80 a year, $2.40 a half year.

WEATHER OF THE WEEK ENDING APRIL 6

Last week was abnormally warm and precipitation was mostly moderate to heavy from the middle and lower Mississippi Valley eastward and in the extreme Northwest, with little or none elsewhere. Stormy weather occurred east of the Rockies April 1 to 3 as an area of low pressure, with strong storm intensity, moved northeastward from the lower Great Plains. The week was unseasonably warm in virtually the entire Nation, with weekly averages 6° to 9° above normal in California, the Rocky Mountain States and the Great Plains and slightly above normal to 3° above elsewhere. Maximum temperatures ranged in the 80's and 90's on several days in Texas, Oklahoma and the Far Southwest, and in the 70's and 80's on 3 days in Kansas; Shenandoah, Iowa, on April 2 recorded 80°, and on April 5 Salt Lake City, Utah, had 82° which was the highest on record there for so early in the season; and near record highs in the 60's and 70's were measured in Montana. Rainfall, falling on 2 or 3 days, exceeded an inch in many areas of the East and South, keeping soil moisture plentiful to excessive. Minor to locally severe floods occurred in a number of streams from Iowa and northern Missouri eastward through the southern Great Lakes region and southern New England.

Dry weather continued in the extreme upper Mississippi Valley, much of the Great Plains and Far Southwest. Fires burned many acres of grasslands and some homes in Minnesota last week, some grass fires in Kansas were blown out of control by high winds, and prairie fires were a constant threat in South Dakota. High winds whipped up dust in western Texas on April 2 and in east central and southeastern Colorado on March 31 and April 2. In northern areas east of the Rockies snow and ice melted rapidly. In New York State the only remaining snow cover is in the Adirondack Mountains, the cover is gone in Lower Michigan, and in Wisconsin the cover is limited to the northern woodlands. Ice is out of many streams in Wisconsin and the soil temperature is up to 40° to a depth of 40 inches at Ames, Iowa. On March 31, severe thunderstorms with hail up to the size of hen's eggs occurred in Payne and Creek Counties, Oklahoma, where a tornado destroyed half of Silver City, injuring 6 persons; and a tornado in southern Marshall County injured 13 persons and caused extensive damage. On April 2, tornadoes killed 23 persons and caused extensive damage in northeastern Texas. On the same date, tornadoes in the vicinities of Dade City, Orlando and Mims, Florida, were blamed for at least 1 death, numerous injuries and considerable property destruction. High winds caused some minor damage in southeastern Wyoming on April 2, and thunder squalls caused scattered damage in Georgia on April 1. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GRASSHOPPERS - WISCONSIN - Overwintering Pardalophora apiculata, Cortophaga viridifasciatus, Arphia sulphurea and Epitettix simplex can be found over much of the State, the latter species being rare. Of 15 A. sulphurea noted, surrounded by snow, all were in the fourth instar. (Wis. Coop. Sur.).

BILLBUGS - ALABAMA - Few specimens taken from burclover in Lee County. (Guyton). GEORGIA - Calendra callosa infesting volunteer corn in Brooks County. (Johnson).

CHINCH BUG (Blissus leucopterus) - TEXAS - Heavy infestations and damage reported on young grain sorghum in Jim Wells and Nueces Counties. (Texas Coop. Rpt.).

GREENBUG (Toxoptera graminum) - TEXAS - Infestations ranging from less than one per foot to over 200 per foot, generally in small grains in Dallas-Ft. Worth area. Parasitism by Aphidius testaceipes has been very heavy and lady beetle populations are very large. (Chada). Infestations decreased past 2 weeks in Foard and Knox Counties. Beneficial insects prevalent enough to be of real value. (Turney). Infestations very spotted in fields in Potter, Oldham, Deaf Smith, Castro and Parmer Counties. Ranged zero to 500-600 per linear foot, with some controls applied. (Daniels). Attacked oats in Brazos and Burleson Counties sufficiently to warrant controls. (Randolph). LOUISIANA - Very light on oats in Baton Rouge, Allen and St. Landry Parishes. Scarce in northern parishes at present. (Spink). OKLAHOMA - Of 367 small grain fields observed in Payne, Noble, Kay and Garfield Counties about 20 percent showed some damage, mostly light, with some medium and heavy damage present. Most damage to barley. Of 469 fields observed in Kingfisher, Blaine and Logan Counties, about 15 percent showed damage ranging from light to heavy. Controls applied to large acreage in the Kingfisher-Blaine-Logan county area. (Henderson, Thompson). Damage appearing in fields of winter oats and barley in Pawnee County, controls under way. (Garlington). Averaged 5-100 per linear foot in 4 wheat fields in Mulhall area, Logan County. Severe damage to barley and oats continued in Noble County. Damage appeared in many wheat fields. Controls widespread throughout north central area. (Stiles). Counts ranged 4-6 to 10-20 per linear foot in 2 wheat fields checked in Davidson area, Tillman County. Very few noted in wheat fields checked in Comanche County. (Hatfield). NEW MEXICO - Continued to build up. Often more than 100 per linear foot in wheat fields in Curry and Roosevelt Counties. (N. M. Coop. Rpt.). MISSOURI - Very light and widely scattered on barley and wheat over southwest area, with 0-2 per linear foot of row. (Kyd, Thomas, Munson).

ENGLISH GRAIN APHID (Macrosiphum granarium) - TEXAS - Small populations still present in north central area small grain fields. (Chada). Medium on small grain in Foard County. (Turney). MISSOURI - Light, 0.5-25 per linear foot of row, and common in most small grain fields in southwest area. (Kyd, Thomas, Munson).

WHEAT CURL MITE (Aceria tulipae) - KANSAS - Light in a Doniphan County wheat field. (Peters).

WINTER GRAIN MITE (Penthaleus major) - MISSOURI - Counts range 0-16 per linear foot in southwest area small grain fields; no damage evident. (Kyd, Thomas, Munson).

AN APHID - ARIZONA - Averaged 7 per infested head of wheat in Maricopa and Pinal Counties; 20 percent of heads infested. (Ariz. Coop. Sur.).

ARMYWORM (Pseudaletia unipuncta) - LOUISIANA - Very light on white clover and oats in Allen, St. Landry and Baton Rouge Parishes. (Spink). MISSOURI - First moths of season observed at lights, March 30, in southwest area and April 3 in central area. Few fourth and fifth-instar larvae present in grassy margins of southwest area alfalfa fields. In most instances larvae feeding in alfalfa crowns. (Kyd, Thomas, Munson).

GREEN CLOVERWORM (Plathypena scabra) - TEXAS - Light on alfalfa in Brazos and Burleson Counties. (Randolph).

CUTWORMS - TEXAS - Peridroma margaritosa ranged none to very light on hubam clover and alfalfa in Brazos and Burleson Counties. (Randolph). NEW MEXICO - Caused some damage to alfalfa near Tucumcari, Quay County. (N. M. Coop. Rpt.). MISSOURI - Larvae averaged 0.5-2 per crown along grassy margins of alfalfa fields in Newton and Jasper Counties. Infestations practically nonexistent within the fields. (Kyd, Thomas, Munson).

ALFALFA WEEVIL (Hypera postica) - MARYLAND - No larval activity noted in central sections. One adult taken by sweeping alfalfa at Ellicott City, Howard County. (U. Md., Ent. Dept.). NORTH CAROLINA - Injury appearing in untreated fields in Lincoln County. (Jones). GEORGIA - Larvae ranged 1-3 per bud in alfalfa in Oconee County. (Johnson).

CLOVER LEAF WEEVIL (Hypera punctata) - DELAWARE - Larval feeding injury to clover noticeably increased in Sussex County. (Burbutis, Conrad). MARYLAND - Larvae light on red clover at Ellicott City, Howard County. (U. Md., Ent. Dept.). ALABAMA - Larvae plentiful on burclover in Lee County. (Guyton). KANSAS - Averaged 2 larvae per square foot of crown area in 3 alfalfa fields in Geary and Riley Counties. (Peters, Brady). MISSOURI - Small larvae averaged 2-5 per crown of alfalfa in southwest area. Evidence of a fungus disease present on 33-50 percent of larvae. (Kyd, Thomas, Munson).

LESSER CLOVER LEAF WEEVIL (Hypera nigrirostris) - IDAHO - Adults active in Deer Flat clover-growing area south of Caldwell, Canyon County. Considerable feeding evidence observed. (Waters).

CLOVER ROOT CURCULIO (Sitona hispidula) - IDAHO - Large numbers of adults active in red clover and alfalfa fields in southwestern section during warmer days. (Waters).

SWEETCLOVER WEEVIL (Sitona cylindricollis) - KANSAS - Adults caused some damage to Riley County sweetclover. (Lawson).

FLEA BEETLES - UTAH - Active on mustards in Box Elder County. (Knowlton).

SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi) - ALABAMA - Adults plentiful in clover and pastures in Wilcox County. (Grimes, March 27).

COWPEA APHID (Aphis medicaginis) - TEXAS - Light on alfalfa and hubam clover in Brazos and Burleson Counties. (Randolph).

PEA APHID (Macrosiphum pisi) - DELAWARE - Populations on alfalfa increased slightly in Sussex County. (Burbutis, Conrad). MISSOURI - Ranged 1-15 per alfalfa crown in fields surveyed. New growth ranged 2-5 inches over southwest area. (Kyd, Thomas, Munson). KANSAS - Ranged as high as 75 nymphs and adults per sweep in alfalfa in Geary and Riley Counties, and up to 50 per 2-inch square of crown area on a roadside embankment in Geary County. (Peters, Brady). OKLAHOMA - Averaged 1-15 per sweep in 3 Choctaw County alfalfa fields. (Goin). TEXAS - Averaged 25 per foot of row and attacked alfalfa in Dallas-Ft. Worth area. (Chada). Light on alfalfa and hubam clover in Brazos and Burleson Counties. (Randolph). Light on vetch in Delta County. May build up if weather conditions permit. (Davis). ARIZONA - Heavy on alfalfa throughout Salt River Valley. (Ariz. Coop. Sur.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - MISSOURI - None found in southwest area. (Kyd, Thomas, Munson). KANSAS - Counts per 25 plants ranged 0-11 in 3 areas of Riley County, 0-52 in 4 areas of Cloud County and 0-62 in 5 areas of Jewell County, March 20, 21 and 22, respectively. (Simpson, Burkhardt). None found by sweeping or field examination of individual alfalfa plants in fields or roadside embankments in Geary and Riley Counties. (Peters, Brady). OKLAHOMA - Spot checks showed low numbers in western Okfuskee County, zero to two per sweep in Choctaw County and up to 5,000-7,000 per square foot near Lawton. (Hatfield, Goin, Meharg). Averaged 1,089 per square foot of crown area in some Payne County alfalfa fields, an increase of 53 percent over last week. (Ketner). TEXAS - Light to medium on alfalfa in Brazos and Burleson Counties. (Randolph). Very heavy in most fields in north central part of State and some fields severely damaged. (Chada). NEW MEXICO - Many additional heavy infestations found in alfalfa fields in Otero, Chaves and Eddy Counties. (N. M. Coop. Rpt.). ARIZONA - Remained light throughout most of the State, with a damaging infestation reported in one Graham County alfalfa field requiring control. (Ariz. Coop. Sur.). OREGON - None found in fields checked in Hermiston area, Umatilla County, March 16-20. (Goeden).

SWEETCLOVER APHID (Myzocallidium riehmi) - TEXAS - Light to medium on hubam clover in Brazos and Burleson Counties. (Randolph).

LYGUS BUGS (Lygus spp.) - MARYLAND - Three adult L. lineolaris taken in 50 sweeps of alfalfa at Ellicott City, Howard County. (U. Md., Ent. Dept.). ARIZONA - Primarily L. hesperus, beginning to reproduce rather heavily in alfalfa throughout State. Averaged 15 nymphs per 50 sweeps in 10 fields in Maricopa and Pinal Counties. (Ariz. Coop. Sur.). OREGON - Averaged 3-4 adults per square foot in cultivated fields in Hermiston area, Umatilla County, March 16-20. (Goeden). UTAH - Common on roadside mustards in central and northern areas of the State. (Knowlton).

LEAFHOPPERS - UTAH - Aceratagallia spp. active in Cache County alfalfa fields. (Knowlton).

THRIPS - UTAH - Active in Salt Lake County alfalfa fields. (Knowlton). ARIZONA - Heavy in some Salt River Valley alfalfa fields, particularly in Pinal County. (Ariz. Coop. Sur.).

GREEN JUNE BEETLE (Cotinus nitida) - NORTH CAROLINA - Large numbers of larvae in pastures in Cherokee County. (Nave, Farrier).

SUGARCANE BORER (Diatraea saccharalis) - LOUISIANA - No egg masses, feeding signs or deadhearts observed at 44 stations throughout sugarcane belt. One adult taken in light trap at Baton Rouge. (Spink).

FRUIT INSECTS

APHIDS - DELAWARE - A. pomi nymphs abundant on apples in Sussex County. (Kelsey). Eggs have hatched in all counties. (Late News). PENNSYLVANIA - Aphis pomi and Rhopalosiphum fitchii hatching on apple in southeast Pike County. The latter to a limited extent. (Menusan, Gesell). ILLINOIS - Hatching and on apple March 28. Overwintering egg populations higher than normal in central and in scattered southern areas. (Meyer). INDIANA - Jonathan fruit spurs are in stage 1 and aphids have begun hatching. (Marshall). OREGON - Overwintering eggs abundant on apple in Klamath County in January. (Ventrees). ARIZONA - Toxoptera aurantii increasing on some citrus in Maricopa County, especially that needing top work. (Ariz. Coop. Sur.).

PEACH TREE BORERS - UTAH - General in Utah County stone fruit orchards. (Barlow, Knowlton). NEW MEXICO - Sanninoidea sp. damaging peach trees at Tucumcari, Quay County. (N. M. Coop. Rpt.).

PLUM CURCULIO (Conotrachelus nenuphar) - GEORGIA - Heavy in some orchards. Averaged 10.1 and 12.8 adults per tree on March 26-27 on outside row of one commercial peach orchard. Nothing found in another orchard. This indicates lighter infestations where they were light in 1958 or where controls were applied. On March 31, 13.2 adults per tree were caught on outside row of commercial peach orchard. This emergence from hibernation was caused by a 61° F. mean temperature over a 5-day period. Egg deposition is underway by females taken from peach orchards. (Snapp).

PLANT BUGS - ILLINOIS - Active for some time and now moving to peach trees. (Meyer) UTAH - Lygus spp. common in orchards in central and northern areas. (Barlow, Knowlton).

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) - ILLINOIS - First moth observed on March 31. (Meyer).

OLIVE SCALE (Parlatoria oleae) - CALIFORNIA - Heavy on almond and apricot trees in Tracy, San Joaquin County. (Cal. Coop. Rpt.).

A TWIG PRUNER (Elaphidion sp.) - OKLAHOMA - One percent of 300 limbs infested in an untreated, improved variety pecan orchard and no infestation was noted in 150 limbs in an untreated native pecan orchard at Stillwater, Payne County. (Bieberdorf, VanCleave).

PECAN NUT CASEBEARER (Acrobasis caryae) - OKLAHOMA - One percent of 300 limbs infested in an untreated, pecan orchard of improved varieties and two percent of 150 limbs infested in an untreated native pecan orchard at Stillwater, Payne County. (Bieberdorf, VanCleave).

PECAN PHYLLOXERA (Phylloxera devastatrix) - LOUISIANA - Newly hatched nymphs migrating to buds in large numbers on heavily infested trees of Schley variety pecan, Caddo and Bossier Parishes. Overwintering eggs hatching on Caspiana pecan but not so numerous on this variety. (Spink).

HICKORY SHUCKWORM (Laspeyresia caryana) - Larvae and pupae heavy in Lee County. (Guyton).

SAN JOSE SCALE (Aspidiotus perniciosus) - Found on some grape plants at the Purdue experiment station. (Marshall).

THRIPS - UTAH - Active in Davis County orchards. (Barlow, Knowlton). ARIZONA - Scirtothrips citri heavy for this time of year on citrus in Salt River and Yuma Valleys. Indicate a possible damaging thrips year for citrus. (Ariz. Coop. Sur.). OREGON - Taeniothrips inconsequens peak emergence reached March 22-28. Populations low and below economic level in observed orchards. Peak emergence about same as during 1958. (Jones).

CALIFORNIA RED SCALE (Aonidiella aurantii) - CALIFORNIA - Heavy on citrus in Sacramento, Sacramento County. (Cal. Coop. Rpt.).

A MEALYBUG (Pseudococcus malacearum) - CALIFORNIA - Heavy on citrus trees in Soledad, Monterey County, and in Hayward, Alameda County. (Cal. Coop. Rpt.).

Citrus Insect Situation, Lake Alfred, Florida, Third Week in March - PURPLE SCALE activity decreased sharply this week and some further decrease is expected in the next two weeks as a result of rainy weather and passing of the peak hatching period. There was a slight rise in FLORIDA RED SCALE activity and the present high level of activity will carry through April. CITRUS RED MITE activity decreased markedly and will generally drop through April. There was a slight decline in CITRUS RUST MITE activity and the trend will be downward until mid-April. (Simanton, Thompson, Johnson, March 27).

TRUCK CROP INSECTS

Potato Aphid Survey, New Jersey - February-March - 1959

POTATO APHID (Macrosiphum solanifolii) is a particular pest of tomato and potato crops in the State. Through survey, prediction of outbreaks is a possibility and many fields could be saved from much damage. A SWAMP ROSE (Rosa palustris) is the primary overwintering host for eggs. Most eggs again were found along Racoon Creek in Gloucester County. Counts in the Cumberland-Salem county area were about the same as previous years. Many more eggs were found in the central area than before. Eighteen locations in 7 counties were surveyed. The average per location per 100 buds or crotches was 8.78. In 1958, the average was 1.42 and in 1957, 2.86. Overwintering eggs are more numerous this spring than in 1958 or 1957, and the infestation potential for potato aphids is higher this year than in either previous year. (Coop. Sur., N. J. Dept. Agr., Rutgers Univ.).

BEET LEAFHOPPER (Circulifer tenellus) - OREGON - Early observations indicate populations in Hermiston area below normal. Overwintering host plants in surrounding desert area scarce and this may have influenced the situation. (Goeden). CALIFORNIA - By March 5, populations were heavy enough in southern end of breeding grounds to warrant treatment. By mid-March, hatching in other areas made it necessary to increase spraying activity. By end of March, 6,440 acres in Merced, Fresno, Kings and Kern Counties had been treated. Practically no rainfall was recorded during March, and if winter annuals continue to dry, a movement from breeding grounds should follow about mid-April. However, remnant populations are low and no significant amount of crop damage is expected this season. (Green, Harper).

A MAGGOT (Hylemya sp.) - CALIFORNIA - Heavy and damaging squash seedlings in Watsonville, Santa Cruz County. (Cal. Coop. Rpt.).

FLEA BEETLES - UTAH - Active on mustards in Box Elder County. (Knowlton). LOUISIANA - Phyllotreta sp. (probably bipustulata) averaged 50 per 100 sweeps on turnips at LaPlace. (Spink).

DIAMONDBACK MOTH (*Plutella maculipennis*) - GEORGIA - Light to moderate on cabbage in 5 southern counties. (Johnson).

CABBAGE APHID (*Brevicoryne brassicae*) - GEORGIA - Moderate to heavy on cabbage in Colquitt, Grady, Thomas, Brooks and Lowndes Counties. (Johnson).

BEAN LEAF BEETLE (*Cerotoma trifurcata*) - GEORGIA - Light on beans in Grady County. (Johnson).

TOBACCO INSECTS

GREEN PEACH APHID (*Myzus persicae*) - GEORGIA - Light on tobacco beds in 4 southern counties. (Johnson).

TOBACCO FLEA BEETLE (*Epitrix hirtipennis*) - GEORGIA - Light to moderate on tobacco beds in 10 southern counties and moderate to heavy on tobacco in the field in 5 of these same counties. (Johnson).

VEGETABLE WEEVIL (*Listroderes costirostris obliquus*) - GEORGIA - Light to moderate on tobacco beds in 10 southern counties. (Johnson).

COTTON INSECTS

CUTWORMS - TEXAS - Infestations scattered and limited throughout lower Rio Grande Valley. (Deer, March 30).

APHIDS - TEXAS - Appeared in some fields in lower Rio Grande Valley; some controls applied. (Deer, March 30).

DARKLING BEETLES - TEXAS - Damage reported from eastern Willacy and Cameron Counties and one area northwest of Edinburg. (Deer, March 30).

Boll Weevil Survival Surveys in South Carolina, North Carolina and Virginia - Spring 1959

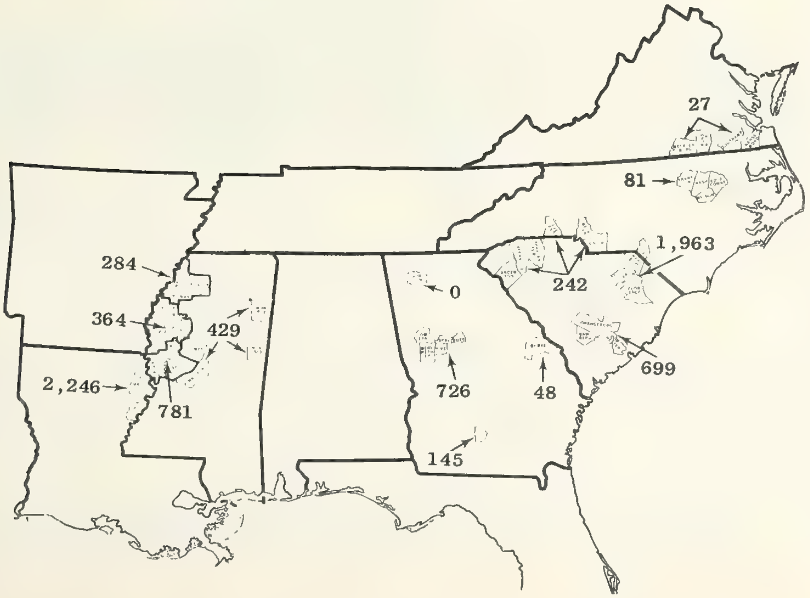
Surface woods trash examinations were made during the period March 2-25 in the same 5 representative areas of South Carolina, North Carolina and Virginia in which fall examinations were made in 1958. Virginia was the lowest in percent survival and the south central section of South Carolina was the highest of the areas sampled; however, the coastal plains of South Carolina and North Carolina had the higher average number of weevils per acre. The 1959 survival percentages are well above the 1958, and the highest in Florence County, South Carolina, since the winter of 1954-55. (Ent. Res. Div., in coop. with States and PPC). See Summary of Boll Weevil Survival Surveys - Spring 1959 for additional information.

SUMMARY OF BOLL WEEVIL SURVIVAL SURVEYS - SPRING 1959

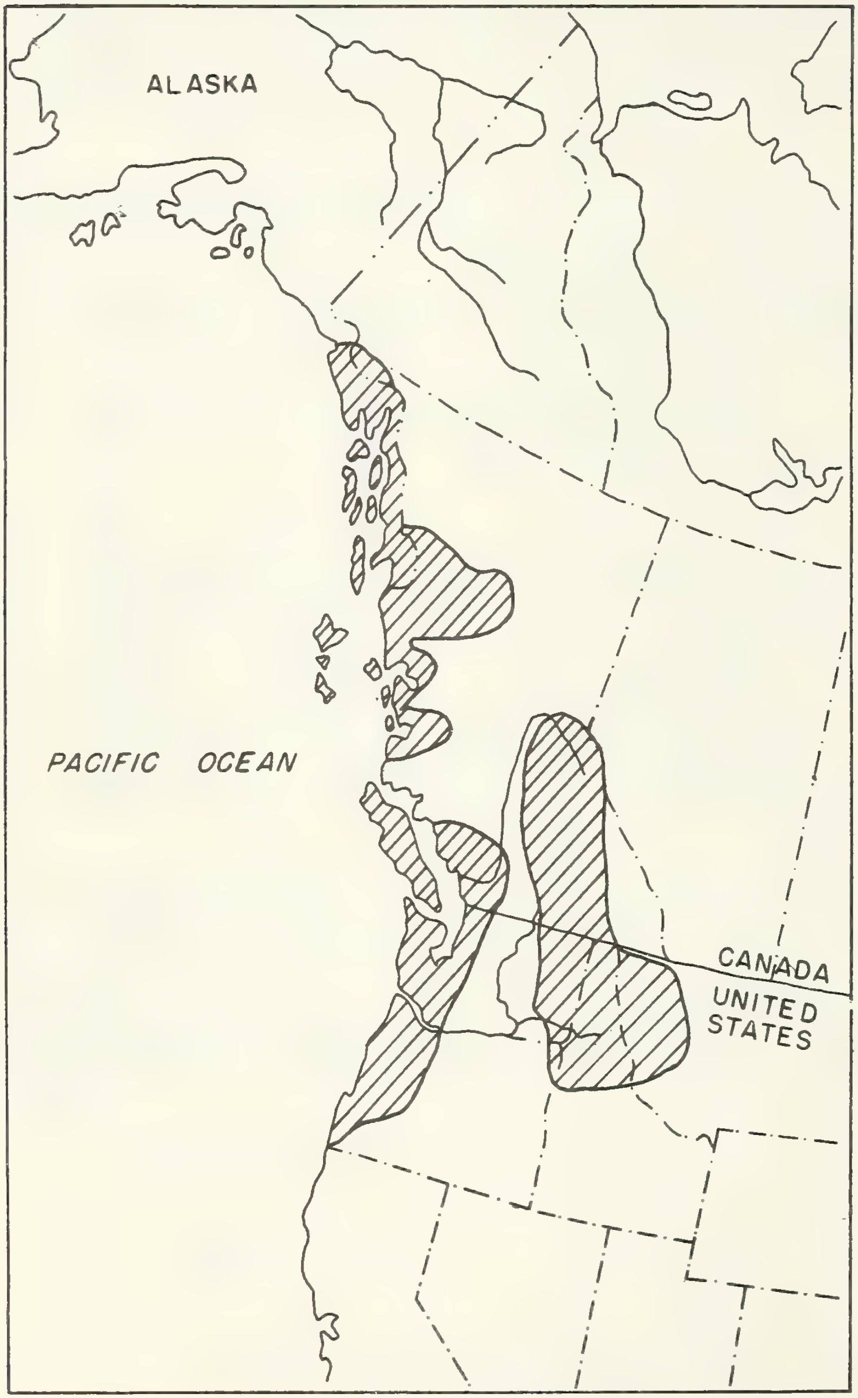
Collections of surface woods trash samples have been made to date in 6 cotton producing states during the spring of 1959 by cooperating State and Federal agencies. The data for the following states have been summarized in previous issues of Vol. 9, Cooperative Economic Insect Report as follows: Georgia - No. 14, page 237; Mississippi - No. 13, page 216; Louisiana - No. 12, page 193. Data from Virginia, North and South Carolina are summarized in this issue.

Boll Weevil Survival - Spring 1959

State	Area or District	Average No. Weevils Per Acre		Percent Survival	
		1959	1958	1959	1958
North Carolina South Carolina Virginia	Area 1 - South Central South Carolina	699	457	70.20	11.50
	Area 2 - Coastal plains (N.C. & S.C.)	1,963	403	42.40	3.50
	Area 3 - Piedmont (N.C. & S.C.)	242	296	9.20	4.40
	Area 4 - North Central North Carolina	81	53.8	9.00	2.40
	Area 5 - Southeastern Virginia	27	53.8	5.30	1.60
Georgia	Northwest	0	97	0.00	9.00
	North central	726	1,307	33.00	26.00
	East central	48	968	12.00	54.00
	South	145	532	100.00	100.00
Mississippi	Lower delta	781	418	17.68	8.51
	Central delta	364	551	7.73	9.31
	North delta	284	381	9.43	3.44
	Hill section	429	219	14.04	5.33
Louisiana	Northeast	2,246	1,480	39.00	18.00



DISTRIBUTION OF HEMLOCK SAWFLY (Neodiprion tsugae)
in Western North America



FOREST, ORNAMENTAL AND SHADE TREE INSECTS

AN ARCTIID (Halisidota argentata) - CALIFORNIA - Widespread on Douglas-fir in vicinity of Lake Pillsbury and Mill Creek, Mendocino National Forest, and on reproduction and saplings on north slopes of Elk Creek area, Glenn County. Present damage not serious but may result in serious defoliation later if natural enemies do not control infestation. (Stevens, Kulosa).

NANTUCKET PINE MOTH (Rhyacionia frustrana) - TEXAS - Medium infestation reported in Kaufman County. (Davis, March 30). OKLAHOMA - Adults becoming active in Stillwater area. (Bieberdorf).

PINE TUBE MOTH (Argyrotaenia pinatubana) - DELAWARE - No adult emergence noted to date on white pine in New Castle County. (Burbutis, Conrad).

AN EUCOSMID (Eucosma gloriola) - PENNSYLVANIA - Attacking Scotch pine terminals. Det. H. W. Capps. (Drooz).

A SAWFLY (Neodiprion pratti pratti) - NORTH CAROLINA - Many small larvae on short leaf, Virginia and loblolly pines in Granville County, March 26. Some injury to needles, an estimated 50 percent of oviposition punctures had produced larvae. Pollen of Pinus taedea had not fallen. (Green, Jones, Farrier).

TENT CATERPILLARS (Malacosoma spp.) - DELAWARE - First hatching of M. americanum noted in Sussex County on wild cherry. (Burbutis, Conrad). TENNESSEE - Appearing in wild cherries over the State. (Mullett). ALABAMA - Larvae of M. americanum observed for first time this year in Wilcox County, week ending March 27. Several webs noticed on wild cherry and other trees in southeastern part of State, week ending April 3. (Grimes).

APPLE APHID (Aphis pomi) - ALABAMA - Light to moderate and feeding on ornamental crab apple blooms in Lee County. (Guyton).

SPIREA APHID (Aphis spiraecola) - ALABAMA - Heavy infestations on new growth of spirea in Lee County. (Guyton).

OLIVE SCALE (Parlatoria oleae) - CALIFORNIA - Medium infestation on a rosebush in Gonzales, Monterey County, is the first record for this county. Also heavy on Modesto ash in Coalinga, Fresno County. (Cal. Coop. Rpt.).

AN ARMORED SCALE (Phenacaspis natalensis) - FLORIDA - Apparent increase in economic importance indicated by samples submitted for identification. Becoming increasingly important on various trees and ornamentals in the State. Increases in severity of infestations and in general distribution over State indicated from sample collections. (Fla. Coop. Sur.).

INSECTS AFFECTING MAN AND ANIMALS

MOSQUITOES - UTAH - Small numbers of adult Anopheles spp., Culiseta spp. and Aedes spp. noted in Weber County. (Fronk, Knowlton).

COMMON CATTLE GRUB (Hypoderma lineatum) - NEW MEXICO - Adults beginning to annoy cattle in Sierra, Torrance and De Baca Counties. (N. M. Coop. Rpt.).

SHEEP KED (Melophagus ovinus) - NEW MEXICO - Especially heavy on lambs in San Miguel County. Light to heavy on sheep in Guadalupe and Lincoln Counties. (N. M. Coop. Rpt.).

CATTLE LICE - NEW MEXICO - Light to heavy on many cattle herds in northern counties. (N. M. Coop. Rpt.).

AMERICAN DOG TICK (Dermacentor variabilis) - OKLAHOMA - Appearing in annoying numbers in limited areas of Payne County. (Howell, Bryan).

STORED-PRODUCT INSECTS

KHAPRA BEETLE (Trogoderma granarium) - CALIFORNIA - Larvae heavy in barley in old refrigerator on farm property and light in chicken feed on second property in Heber, Imperial County. (Cal. Coop. Rpt.).

LESSER GRAIN BORER (Rhyzopertha dominica) - OREGON - Found in a feed mill in Tillamook County. This constitutes a new record for this county. (Foster).

A FLOUR BEETLE (Tribolium madens) - NORTH DAKOTA - Infested stores of pollen substitute in a honey house at Dwight, October 1958. Adults were dispersed throughout the building. This is the first record of a severe infestation of this species in the State, although an occasional adult is recorded from seed houses and homes. Det. T. J. Spilman. (Post).

POTATO TUBERWORM (Gnorimoschema operculella) - UTAH - Was rare in potatoes during 1958 and also to date in the stored crop. (Jorgensen, Knowlton).

BENEFICIAL INSECTS

PARASITES AND PREDATORS - ALABAMA - Several species of cocinellids are plentiful in various crops in Lee County. (Guyton). OKLAHOMA - Hippodamia convergens numbers variable in several areas. (Hatfield, Goin). Coccinellid larvae averaged 3 per foot in Perkins area, Payne County. Numbers exceeded 2 per foot in other areas. None found in many fields. (Henderson, Thompson). Chrysopa sp. adults and larvae ranged zero to 0.2 per sweep in 3 alfalfa fields checked in Choctaw County. (Goin). ARIZONA - Trioxys utilis, Aphelinus semiflavis and Praon palitans recovered from parasitized spotted alfalfa aphids in Camp Verde area of Yavapai County. P. palitans recovered in Cottonwood area of same county at 4,500-foot elevation and for first time in Buckeye area of Maricopa County. Original colony releases were near Tempe, Litchfield Park and Florence. (Ariz. Coop. Sur.). CALIFORNIA - Ceratomegilla vittigera heavy and active in alfalfa fields in Jonesville, Lassen County. (Cal. Coop. Rpt.). UTAH - Coccinellids active at Logan. (Knowlton).

MISCELLANEOUS INSECTS

TERMITES - MARYLAND - Winged forms of Reticulitermes flavipes noted in and around homes in Baltimore and University Hills, Prince Georges County. (U. Md., Ent. Dept.). PENNSYLVANIA - Swarming in homes in Centre and Union Counties and other areas. (Gesell et al.).

PERIODICAL CICADA (Magicicada septemdecim) - TENNESSEE - Major outbreak of thirteen-year-variety (Brood 19) expected to appear early in May. (Mullett).

CORRECTION

CEIR 9(12):194 - KHAPRA BEETLE (Trogoderma granarium) - NEW MEXICO - Since report in CEIR 9(11):171, of finds in Sierra County as of March 16, one additional collection has been found in that county, one in Luna and 8 (7 infested properties) in Dona Ana Counties. The latter two counties are reported for the first time. (PPC).

LIGHT TRAP COLLECTIONS

	Pseud. unip.	Agrot. yps.	Prod. ornith.	Perid. marg.	Feltia subt.
ARIZONA					
Mesa 3/25-31			5	8	
FLORIDA					
Gainesville 3/25-4/1	1	3			14
Quincy 3/25					1
KANSAS					
Hays 4/1		4			
Manhattan 3/30		1			
LOUISIANA					
Baton Rouge 3/27-4/2	6	35	61		8
Franklin 3/2-4/1	9	8	3	7	18
MISSISSIPPI					
*Stoneville 3/28-4/3	738	137		62	
SOUTH CAROLINA					
Charleston 3/30-4/5	14	4		8	13
Clemson 3/28-4/3	6		17	1	1
TEXAS					
Brownsville 3/17-27	88	27	6	3	14

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* Four traps - Stoneville

NEVADA

Prepared by Robert C. Bechtel*

Highlights: SMALLER EUROPEAN ELM BARK BEETLE discovered in the State for the first time. BEET LEAFHOPPER populations and incidence of curly top disease heaviest in recent years. Enormous flights of a GRASSHOPPER, Trimerotropis pallidipennis, and damage to various crops by the nymphs and adults occurred in the southern half of the State. Unusually large populations of TOBACCO FLEA BEETLE caused heavy foliage and light tuber damage to potatoes in two areas. BEET ARMYWORM was more numerous than in previous years and damaged alfalfa and seedling corn and cotton. SCREW-WORM infestations were above normal in the southern half of the State. MOSQUITOES, HORSE FLIES and DEER FLIES were present statewide in abnormally large numbers.

Cereal and Forage Crop Insects: ALFALFA WEEVIL (Hypera postica) populations and damage were above the 1957 level. Adults became active and began laying eggs early in February. Larval populations and damage were highest in mid-May, with some damage continuing later than normal. SPOTTED ALFALFA APHID (Therioaphis maculata) populations were below those of 1957 and varied greatly depending on the season and area. Generally there was an early and late season increase in southern counties and a late season increase in northern counties. Economic infestations were low, as compared with previous years. In southern counties, two introduced PARASITES (Praon palitans and Trioxys utilis) were responsible for much of this decrease. PEA APHID (Macrosiphum pisi) populations remained unusually heavy throughout most of the alfalfa-growing season and were heavier than in 1957. Early season damage was most evident in southern counties and late season damage was prevalent in northern counties. LYGUS BUGS (Lygus spp.) were heavy on abundant range plants in the spring. As these plants dried up, large numbers moved to alfalfa. Alfalfa seed fields were especially hard hit. Some seed fields were treated too late and lost the entire first bloom. GRASSHOPPER populations remained mostly noneconomic although damage to crops occurred in Lincoln County where 5,800 acres were treated for Trimerotropis pallidipennis in June. In northern counties 3,460 acres were treated for CLEAR-WINGED GRASSHOPPER (Camnula pellucida) and approximately 600 acres were treated for a complex of Melanoplus spp. A total of 37,500 acres was treated for MORMON CRICKET (Anabrus simplex), which was an increase of 14,700 treated acres over 1957. First-instar nymphs were present in Pershing County by March 14. DESERT CORN FLEA BEETLE (Chaetocnema ectypa) caused moderate damage to seedling corn in Clark County in April. ENGLISH GRAIN APHID (Macrosiphum granarium) populations increased to highest levels in late June in Churchill and Pershing Counties, with approximately 1,500 acres requiring treatment in the former county. CORN EARWORM (Heliothis zea) was the major pest of field corn in central and southern counties and is one of the important limiting factors in field corn production in Nevada. BEET ARMYWORM (Laphygma exigua) caused moderate damage to seedling corn in Clark and Nye Counties in May and in Churchill County in June. Severe damage to timothy hay fields from heavy ARMYWORM (Pseudaletia unipuncta) populations occurred in Lyon County in September. Various CUTWORMS caused moderate to severe damage to alfalfa in the central, southern and western counties. CLOVER SEED CHALCID (Bruchophagus gibbus) was light in alfalfa seed in Nye County. STINK BUGS, mostly SAY STINK BUG (Chlorochroa sayi), but also CONCHUELA (C. ligata), caused damage to alfalfa seed crops and required treatment in various areas of the State. Heavy populations of BEET ARMYWORM developed on seedling alfalfa in Nye County in May and required treatment.

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* Cooperators include members of the Nevada State Department of Agriculture, other State agencies, Extension Entomologist R. W. Lauderdale, County Agents and pest control operators.

Fruit Insects: APHIDS were the most general pests on fruit trees during 1958, and included APPLE APHID (Aphis pomi), BLACK CHERRY APHID (Myzus cerasi) and Aphis helichrysi. SPIDER MITES (Tetranychus spp.) were less numerous than in 1957. CODLING MOTH (Carpocapsa pomonella) populations were at approximately the same level as in previous years, with damage of 100 percent occurring on unsprayed trees. PEAR-SLUG (Caliroa cerasi) damage to cherries and pears continued to be heavy in western and central areas with most damage occurring in late July from the second brood. Various species of CICADAS damaged smaller limbs and twigs of fruit trees by egg laying in Elko County in June.

Truck Crop Insects: BEET LEAFHOPPER (Circulifer tenellus) populations overwintered on abundant host plants in southern Nevada breeding grounds. Movement to tomato plants in Clark County occurred by April 4 and some curly top symptoms were evident at that time. By April 18, they averaged 2.5 per square foot of row. Damage to tomato seedlings from curly top was at least 10 percent in the field before shipment of the plants. The beet leafhopper did not invade the sugar beet-growing area of Churchill County until late May. At this time they averaged 6.0 per square foot of beet row but very little damage resulted. TOBACCO FLEA BEETLE (Epitrix hirtipennis) populations on potatoes reached a peak in mid-August. Severe defoliation occurred in many fields in Lyon County. Minor surface tuber damage occurred, but was not serious enough to affect the grade. Light populations of POTATO PSYLLID (Paratrizoa cockerelli) occurred on potatoes in Lyon County. ONION THRIPS (Thrips tabaci) caused an estimated 5 percent loss on dry onions. Damage was confined to this amount by insecticide application.

Cotton Insects: BEET ARMYWORM (Laphygma exigua) damaged cotton seedlings in Clark and southern Nye Counties in May. These infestations were controlled by insecticide application. Populations of a SPIDER MITE (Tetranychus sp.) were lower than in 1957, with only 184 acres requiring treatment. LEAFHOPPERS caused defoliation of lower leaves in August in Clark County. THRIPS (Frankliniella spp.) caused moderate damage to terminal buds of seedling cotton in early June in Nye County. Approximately 600 acres were treated. LYGUS BUGS (Lygus spp.) increased in many fields in July and were present in light to heavy populations for the remainder of the season. Over 2,000 acres required treatment to keep damage at a minimum. BOLLWORM (Heliothis zea) was present in small numbers and damage was light. PINK BOLLWORM (Pectinophora gossypiella) and BOLL WEEVIL (Anthonomus grandis) surveys were negative.

Forest, Ornamental and Shade Tree Insects: SMALLER EUROPEAN ELM BARK BEETLE (Scolytus multistriatus) was found in the State for the first time in Las Vegas, Clark County. This beetle is generally distributed throughout the Las Vegas area and was probably introduced in 1956 or 1957. The MOUNTAIN PINE BEETLE (Dendroctonus monticola), RED TURPENTINE BEETLE (D. valens) and WESTERN PINE BEETLE (D. brevicomis) infestation in ponderosa pine in the Crystal Bay area of Lake Tahoe was greatly reduced by the removal of 6,100 trees at a cost of $40,000. Heavy emergence of a BARK BEETLE (Pityophthorus sp.) from dead and injured pinyon pine in Douglas County resulted in damage to small limbs and twigs of healthy trees. SHOT-HOLE BORER (Scolytus rugulosus) populations were heavy in western Washoe County, with heavy damage resulting to apple, peach and related trees. ELM LEAF BEETLE (Galerucella xanthomelaena) adults became active and began laying eggs the last week of May. First-brood pupation began the second week in July. Second-brood adults began egg laying about August 1. Damage to untreated or improperly treated trees was severe. MOURNING-CLOAK BUTTERFLY (Nymphalis antiopa) damaged various trees and shrubs but particularly elms in Clark County.

Insects Affecting Man and Animals: MOSQUITOES (mostly Aedes campestris, A. dorsalis, A. melanimon, A. nigromaculis and A. vexans) were the primary pests included under this category. An abundant water supply contributed greatly to the enormous populations which were present. HORSE FLIES and DEER FLIES were very abundant over the entire State, especially in northern and southern counties. DEER FLIES were most prevalent in the southern part of the State. CATTLE GRUBS, CATTLE LICE, HORN FLY (Siphona irritans), STABLE FLY (Stomoxys calcitrans) and SHEEP KED (Melophagus ovinus) remained at about the same population levels as in previous years. SCREW-WORM (Callitroga hominivorax) populations were higher than in previous years with many more cases being reported, especially in Lincoln County. A CHLOROPID FLY (Hippelates collusor) populations were heavy in late April and May in Clark County. Usually this species does not reach such numbers until later in the season. Populations remained heavy from May through October. A TICK (Dermacentor sp.) was reported as being present in large numbers on dogs and humans in Clark County in late October and early November. HOUSE FLY (Musca domestica) populations were heavy, especially in and around dairies in Clark and Lincoln Counties. ORIENTAL COCKROACH (Blatta orientalis) was also numerous in and around dairies in southern counties. A SUBTERRANEAN TERMITE (Reticulitermes sp.) was again prevalent in western and southern areas, being most serious in Clark County. Migrations of a FALSE CHINCH BUG (Nysius sp.) into dwellings caused much concern to home owners from July through September.

Beneficial Insects: Two introduced PARASITES (Praon palitans and Trioxys utilis) of the spotted alfalfa aphid are established in the field in southern Nevada. At present, P. palitans is the more widely distributed of the two. Various aphid predators such as LADY BEETLES and SYRPHID FLIES remained at high population levels in alfalfa and assisted in holding the pea aphid and spotted alfalfa aphid in check. An ALKALI BEE (Nomia melanderi) was present in alfalfa and assisted in pollination in Churchill and Pershing Counties. Increased use of HONEY BEE (Apis mellifera) was made in seed crop production in 1958. In one area of Humboldt County, however, the use of an incorrect insecticide and improper timing destroyed several colonies of bees.

SUMMARY OF INSECT CONDITIONS - 1958

MINNESOTA

Prepared by Minnesota Division of Plant Industry

Cereal and Forage Crop Insects: EUROPEAN CORN BORER (Pyrausta nubilalis) overwintering mortality averaged 26 percent in April. A high borer population went into the winter but the reduction of 26 percent still left a substantial number of borers. Pupation began in the south May 23 and reached a peak about June 6. Moth emergence began the first of June and extended into the second week in July, with maximum numbers present about July 1. Unusually cool weather throughout June and early July resulted in slow growth of corn and very little egg laying. Low night temperatures were common in late June and restricted moth activity. It was evident in early July that first-generation populations would be low. Unusually cool weather at emergence and egg hatch apparently was responsible. Slow development of the first generation resulted in the second generation coming too late to be of any importance. Damage generally was very light. There were, however, some fields where populations caused injury. Fall density surveys showed the lowest population in many years, the State average being 16 borers per 100 plants as compared with 83 for 1957. GRASSHOPPERS - Below normal spring and early summer temperatures were responsible for late hatch of all species. Extended periods of heavy rains and cool weather over much of the State caused heavy mortality of early instars of all species, especially *Melanoplus bivittatus*. Due to adverse weather, populations were very spotty and generally quite low. There were a few scattered fields with heavy to severe populations and some crop damage. *M. femur-rubrum* remained the dominant species in the State. *M. bivittatus* in the northwest district and *M. differentialis* in the southwest and west central districts are building up. Alfalfa is the principal habitat, but some egg deposition was found in other legumes, roadsides, ditch banks and weedy soil bank fields. Adult and egg surveys in 1958 indicate that populations have declined over much of the State. Four small areas of threatening infestations are present in the southern half of the State, the remainder classified as light or noneconomic. No large areas of severe infestations are indicated. Infestations are expected to be spotty. Local concentrations may develop under favorable weather conditions. BLISTER BEETLE (*Epicauta* spp.) populations were low over much of the State and very low numbers were found during the grasshopper egg survey. MEADOW SPITTLEBUG (*Philaenus leucophthalmus*) was quite general in Houston County on alfalfa and red clover, the first economic infestations in recent years. PEA APHID (*Macrosiphum pisi*) numbers in alfalfa were moderate in May and increased gradually until mid-June when relatively high populations were present in all districts. Counts increased through July, with a slight population decrease in August when predators became numerous. Pea aphid was much more numerous during 1958 than in 1957. Some alfalfa fields were treated. A LEAF SPOT (*Pseudoplea*) on alfalfa was quite general during 1958 and damage was erroneously attributed to pea aphid. PLANT BUGS (*Adelphocoris* spp. and *Lygus* spp.) were of concern to legume seed growers. Populations were generally lower in 1958. First POTATO LEAFHOPPER (*Empoasca fabae*) adults were found in the south on May 23. Cool weather in June and early July contributed to a slow increase in nymphal populations. Numbers were low this past summer. *E. fabae* reached a maximum abundance of 900 per 100 sweeps at St. Paul during 1957, but only 88 per 100 sweeps in the same field during 1958. SPOTTED ALFALFA APHID (*Therioaphis maculata*) - Not found in the State in 1958. Apparently it did not migrate from southern states and probably does not overwinter in Minnesota. SWEETCLOVER WEEVIL (*Sitona cylindricollis*) was not as abundant as in past years and adults were scarce late in season. Spotty infestations of SWEETCLOVER APHID (*Myzocallidium riehmi*) appeared to build-up in June in the Ada and Beltrami areas but declined and were not economic the rest of the season.

SIX-SPOTTED LEAFHOPPER (*Macrosteles fascifrons*) was low and aster yellows were not a problem. Light trap collections of ARMYWORM (*Pseudaletia unipuncta*) were generally small during June in western areas. Cool weather restricted moth activity. Scattered, spotty infestations occurred in the northwest and west central districts in early July. Lodged grain, especially barley, seemed to be most commonly infested. Some fields were treated. Rye was the only crop which sustained much damage. Heads were clipped in several fields. Further damage was not noted as grain crops matured and were harvested. Low numbers of ENGLISH GRAIN APHID (*Macrosiphum granarium*) were noted in the northwest district during early June and populations increased throughout western areas. Predators were extremely low. Cool weather continued and aphid populations built up throughout northwest, west central and central districts. Predators did not multiply enough to check the aphid buildup. There were great variations between fields but little evidence of injury. Late June brought indications of predator buildup and by the first week in July aphid populations appeared to decrease. As the grain crops began to mature and predators increased, aphid numbers declined rapidly. Most controls were in the northwest district, with approximately 14,000 acres of grain treated. An APHID (*Toxoptera viridirubra*), reported from wheat in Marshall County, is the first record for the State and the first record for the host plant. SIX-SPOTTED LEAFHOPPER (*Macrosteles fascifrons*) was quite low in late May compared with extremely heavy populations present in 1957. The State did not experience heavy migrations from the south as in 1957. Some growers treated aster yellows susceptible truck crops. WHEAT MIDGE (*Sitodiplosis mosellana*) was reported in Marshall, Kittson and Roseau Counties on August 15, and appeared confined to late-seeded wheat fields.

Loss estimates range 1-10 percent. BEAN LEAF BEETLE (Cerotoma trifurcata) populations were high in Blue Earth County on soybeans, with up to 80 percent defoliation in many fields. PAINTED-LADY (Vanessa cardui) larvae fed on thistles and cockelbur in south central, southwest and west central districts, with some movement to soybeans in weedy fields. A CORN ROOTWORM (Diabrotica sp.) was a problem in the southern third of the State on fields in which corn had followed corn for several years. Severe lodging occurred in some fields. About 70,000 acres were treated, an increase over 1957. SEED-CORN MAGGOT (Hylemya cilicrura) was more of a problem on soybeans. Spotty infestations were reported in late June on soybeans and some cucumbers, with moderate to severe damage. CORN LEAF APHID (Rhopalosiphum maidis) was heavy on corn statewide. Predators were high in late summer but aphid populations continued at a high level. Most of the corn seed planted was treated for WIREWORMS. Approximately 20,000 acres received a soil treatment at seeding time. Wireworm problems were spotty as usual. High populations were not controlled with seed treatment. Approximately 10,000 acres were treated for CUTWORMS. Infestations were local. BEET WEBWORM (Loxostege sticticalis) infestations were higher in sugar beets than in the past several years. Heavy moth populations occurred in northwestern beet fields in early July, when treatments were begun and continued into August. The entire Red River Valley acreage was treated. Poor control was once again experienced where treatment was applied to late larval instars. In the west central district, severe damage occurred to some soybean fields.

Fruit Insects: Apple - Apple bloom occurred in the La Crescent area May 10-11. CODLING MOTH (Carpocapsa pomonella) control was excellent in commercial orchards, where applications began at petal-fall. Eggs hatched June 6-14. Second-generation control achieved with apple maggot sprays. Dry season increased MITE populations in some orchards where treatments were not applied at proper times. APPLE MAGGOT (Rhagoletis pomonella) emerged July 4 in the La Crescent area and July 8 in the Twin City area. Fly activity continued into the wealthy harvest season, September 1-10. Populations were higher than in the previous 15-20 years. Control was achieved only in commercial orchards where thorough applications of spray were made throughout July and August. EYE-SPOTTED BUD MOTH (Spilonota ocellana) occurred in one south central orchard, the first serious infestation reported in the State in recent years. APPLE CURCULIO (Tachypterellus quadrigibbus) and PLUM CURCULIO (Conotrachelus nenuphar) caused very little damage where properly recommended treatments were used in petal-fall spray. Emergence in La Crescent occurred May 10-14. RED-BANDED LEAF ROLLER (Argyrotaenia velutinana) adults and eggs were observed May 16 in the southeast. Egg hatch was nearly complete May 23. Harvest damage was known to be severe only in one orchard. OYSTERSHELL SCALE (Lepidosaphes ulmi) hatching was nearly complete May 29. Strawberries - SAWFLY control was achieved in commercial plantings. STRAWBERRY WEEVIL (Anthonomus signatus) control recommendations were made at the time the first blossoms appeared. WHITE GRUBS (Phyllophaga spp.) were troublesome throughout the growing season, particularly in new fields preceded by grass sod. CYCLAMEN MITE (Steneotarsonemus pallidus) was serious on susceptible varieties in all areas, especially in the northern half of the State and commercial plantings at Rochester and La Crescent. Some varieties which appear to be nonsusceptible when grown in the southern half of the State have been found seriously infested in the Iron Range and Duluth areas. Populations of SPIDER MITES were high in some areas due to dry weather conditions. Heavy localized infestations occurred throughout the State. LYGUS BUGS (Lygus spp.) were present in some plantings. Raspberries - RASPBERRY SAWFLY (Monophadnoides geniculatus) was severe in some unsprayed fields and RASPBERRY CANE BORER (Oberea bimaculata) was severe, especially in old fields. TWO-SPOTTED SPIDER MITE (Tetranychus telarius) occurred in heavy localized infestations.

Forest, Ornamental and Shade Tree Insects: FOREST TENT CATERPILLAR (Malacosoma disstria) again maintained itself in St. Louis and Carlton Counties, with the area of defoliation slightly larger than in 1957. Defoliation occurred principally on aspen over a 1,260-square-mile area, being complete on 288 square miles. Parasitism of collected cocoons by Sarcophaga aldrichi was 54.2 percent and by other species, 11.6 percent. Light traps operated at 20 northeastern locations showed the largest catches to be northwest of Duluth at Alborn and Cotton, with no significant population buildup in other areas. The average number of egg masses per tree was 10.7, with 10 egg masses per tree, generally enough to cause complete defoliation. SPRUCE BUDWORM (Choristoneura fumiferana) continued to threaten the spruce-fir type of the State, with some defoliation on 1,342,000 acres of a total of 1,910,000 acres. It is believed that the infestation will increase in area and intensity. An aerial survey, covering 6,900,000 acres, was flown in July across the State. Two observers recorded the defoliation of spruce-fir type into classes of previous (obviously repeated heavy defoliation), heavy, moderate, light and none. Classes of defoliation and acreage were as follows:

Class	Acres of Defoliation
Previous	98,000
Heavy	541,000
Moderate	324,000
Light	379,000
None	568,000
Total	1,910,000

Larval and egg-mass surveys were conducted during July to check the aerial survey, to obtain general information on annual population fluctuations and provide data by which potential budworm populations may be forecast.

Early in June, approximately 12,000 acres of spruce-fir type on the Kabetogama Peninsula of Koochiching County were sprayed for spruce budworm control. The 1957 egg-mass survey showed an average of 5.5 egg masses per 15-inch branch sample, indicating a very high population for 1958 season. Pre-spray larval sampling showed 21 larvae per 15-inch branch sample, enough for complete defoliation. The post-spray larval sampling showed 6.8 larvae per 15-inch branch sample. Cold weather probably slowed the kill and mortality may have continued after sampling was completed. The 1958 egg-mass survey indicated a count of 0.7 egg masses per 15-inch branch sample in the spray area. In the sprayed area, 67 percent of the new foliage was retained, compared with 26 percent in the adjoining unsprayed area. These data indicate the spraying was a success and defoliation next summer will, at most, be only light.

Ground survey and aerial observations made in connection with other aerial surveys indicate no buildup of JACK-PINE BUDWORM (Choristoneura pinus) populations. There were a few scattered areas of very light defoliation, principally near Bemidji, Cass Lake and northern St. Louis County. No top killing or tree mortality was observed. LARCH SAWFLY (Pristiphora erichsonii) continued as a serious defoliator of tamarack. An aerial defoliation survey showed that the area of heavy defoliation had increased over that of 1957, chiefly in St. Louis County and in eastern Koochiching and Itasca Counties. Light to moderate defoliation occurred chiefly west and south of the area of heavy defoliation. INTRODUCED PINE SAWFLY (Diprion similis) again caused heavy defoliation on white pine in Crow Wing and Morrison Counties. Some spraying was done on private land. Biotic factors appear to keep this insect from larger and continued outbreaks. Trees subjected to one year of heavy defoliation appear to recover the next year. RED-HEADED PINE SAWFLY (Neodiprion lecontei) was important in jack pine plantations in Aitkin, Kanabec and Sherburne Counties. Defoliation by YELLOW-HEADED SPRUCE SAWFLY (Pikonema alaskensis) was very apparent in the southern part of St. Louis County around Independence. Some mortality will probably result in spruce which has been defoliated repeatedly. SWAINE JACK-PINE SAWFLY (*Neodiprion swainei*) caused light defoliation on jack pine in Cass and Crow Wing Counties. WHITE PINE WEEVIL (*Pissodes strobi*) infestation occurred in many jack pine plantations throughout the State. In some areas, 3-5 percent of the trees showed typical injury. Heavy infestations of a LECANIUM SCALE were reported from several areas on elms. JACK-PINE SAWFLY (*Neodiprion pratti banksianae*) was occasionally light in jack pine. PINE ROOT COLLAR WEEVIL (*Hylobius radicis*) caused some jack pine tree mortality and was heavy on Scotch pine in Cass County. PINE SPITTLEBUG (*Aphrophora parallela*) was abundant in late June, with no apparent damage noted. PINE BARK APHID (*Pineus strobi*) was heavy in white pine plantations near Zimmerman. PINE NEEDLE SCALE (*Phenacaspis pinifoliae*) was heavy around Twin Cities, especially on mugho and spruce. COOLEY SPRUCE GALL APHID (*Chermes cooleyi*) was occasionally heavy on spruce and fir, causing tree deformities, as did EASTERN SPRUCE GALL APHID (*Chermes abietis*). EUROPEAN FRUIT LECANIUM (*Lecanium corni* complex) was unusually heavy and there were some heavy infestations of COTTONY MAPLE SCALE (*Pulvinaria innumerabilis*) around Twin Cities. VARIABLE OAK LEAF CATERPILLAR (*Heterocampa manteo*) was very light this year. EASTERN TENT CATERPILLAR (*Malacosoma americanum*) occurred in most areas where FOREST TENT CATERPILLAR was trapped. BIRCH LEAF MINER (*Fenusa pusilla*) was common around Twin Cities. MAPLE BLADDER-GALL MITE (*Vasates quadripedes*) was common on lawn trees in the same area. PAINTED MAPLE APHID (*Drepanaphis acerifolia*) was heavy around Duluth.

Insects Affecting Man and Animals: MOSQUITOES - *Aedes stimulans*, *A. punctor* and *A. excrucians* were found in late-larval stages the first of May. *Aedes cinereus*, *A. excrucians*, *Culiseta inornata* and *C. minnesotae* were reported in various stages the second week of May, with some adult *Culiseta* present. Some *Aedes vexans* larvae were found by May 26, but peak hatches in the Twin City area did not occur until about mid-June. A large hatch occurred about July 10 following a heavy rain about a week previous. In late summer and fall *A. vexans* and *Mansonia perturbans* were generally prominent in light trap collections and were also commonly taken in biting collections during this period. Generally, populations were considerably less than the peak season of 1957. Lack of snow and early spring rains in many areas reduced the extent and number of breeding sites and consequently the numbers of early-hatching mosquitoes. In the Twin City area and also most other areas of the State, summer rainfall was below normal. CLOVER MITES were exceedingly troublesome in the Twin City area and in many locations throughout the State during the spring and early summer. AMERICAN DOG TICK (*Dermacentor variabilis*) was abundant in Twin City, St. Cloud and Brainerd areas in May and early June. FLEAS (*Ctenocephalides felis* and *C. canis*) were frequently reported from homes, yards and animal quarters during August and September.

Miscellaneous Insects: Several new infestations of EASTERN SUBTERRANEAN TERMITE (*Reticulitermes flavipes*) were reported in St. Paul, making a total of 9 properties (3 commercial and 6 private) known to be infested. Five of the infested private dwellings are older houses and all are within a two-block radius. The infested commercial establishments are located in a warehouse section of the Midway district in St. Paul.

Beneficial Insects: *Bessa selecta* was a common parasite of many sawflies. Up to 30 percent of larch sawfly and 41 percent of yellow-headed spruce sawfly populations were parasitized in some areas. Red-headed and Swaine jack-pine sawfly each received some parasitism. *Sarcophaga aldrichi* parasatized 54 percent of the forest tent caterpillar. A number of PARASITES are responsible for reducing jack-pine budworm to a sub-economic level.

State-Federal Cooperative Surveys: The JAPANESE BEETLE (*Popillia japonica*) survey was enlarged during 1958. There were 262 traps placed at points of entry such as airports, truck and rail terminals throughout the State. No Japanese beetles were found. SOYBEAN CYST NEMATODE (*Heterodera glycines*) surveys were conducted in 21 soybean producing counties. A total of 281 soil samples were taken, all of which were negative. The 18 counties surveyed in 1957 were also negative.

Insect Control on Croplands in Minnesota - 1958

Canning Crop Insects:		Acreage Treated
European Corn Borer		
First Generation		Trace
Second Generation		
Ground Spray	9,232	
Aerial Spray	9,882	19,114
Corn Earworm		
Ground Spray	2,168	
Aerial Spray	7,069	9,237
Pea Aphid		
Ground Spray	17	
Aerial Spray	33,224	33,241

Field Crop Insects: 1/

Grasshopper (All crops)	7,310
European Corn Borer (Field Corn)	30,960
Cutworms (Corn)	13,625
Aphids (Barley, Oats, Wheat and Rye)	14,380
Sweetclover Weevil (Sweetclover)	1,975
Red Clover grown for seed (Plant Bugs, etc.)	2,880
Alsike Clover grown for seed (Plant Bugs, etc.)	2,000
Alfalfa grown for seed (Plant Bugs, Pea Aphid, etc.)	10,325
Northern Corn Rootworm	71,000
Wireworms (Corn) - Seed Treatment	66,510
Soil Treatment	31,105
Sugar Beets - Beet Webworm (Almost all acreage treated)	67,000
Armyworm (Small Grain)	3,599
Miscellaneous Insects	3,025

Fruit Insects: 2,000 acres commercial apple orchards - mainly in about 15 counties in southeast part of State - treated from 7 to 14 times each, with hydraulic or concentrate sprayers.

1/ Incomplete figures

Truck Crops: 1/	Acreage Treated
Potato Insects	25,627
Carrots	430
Cabbage	1,171
Onions	1,228
Forest Insects:	
Spruce Budworm	12,000
Introduced Pine Sawfly	320
Red-Headed Pine Sawfly	50
Mosquitoes:	
Metropolitan Mosquito Control District in Twin City area (Breeding site treatment only)	
Aerial	42,878
Ground	56,399
Others (Towns, villages, resorts, etc. - adult treatment)	
Aerial	12,622
Ground	10,000

1/ Incomplete figures

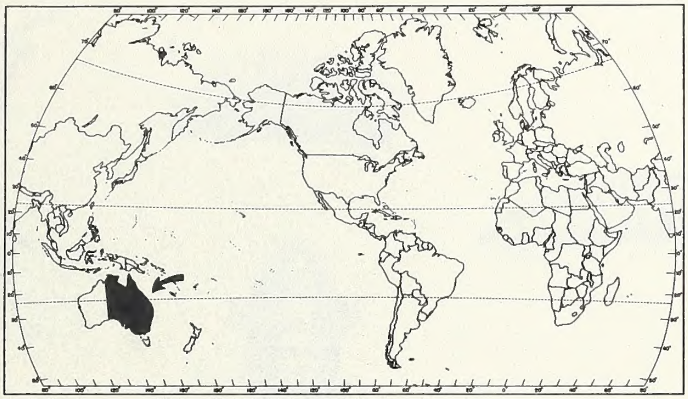
INSECTS NOT KNOWN TO OCCUR IN THE UNITED STATES

PUMPKIN BEETLE (Aulacophora hilaris (Boisduval))

Economic Importance: This chrysomelid is a serious pest of cucurbits over a large area of Australia. It is probably the outstanding pest of these crops wherever it occurs in the country. Considerable losses occur annually in New South Wales, particularly in early crops, but periodically a general outbreak occurs and most of the young spring crops are heavily damaged or destroyed. Replanting of the crop becomes necessary in some instances. There are several species of Aulacophora in Australia and many attack cucurbits, but A. hilaris is probably the species of the greatest importance. In New South Wales, A. hilaris is more prevalent in the inland areas of lower elevations and milder temperatures.

Distribution: Widely distributed in Australia, being recorded in Queensland, Northern Territory, South Australia, Victoria and New South Wales.

Hosts: Prefers cucurbitaceous plants, but will attack many other crops and wild plants including alfalfa, apple, beans, black nightshade, Carduus, cherry, corn, dock, Eucalyptus, fig, gooseberrygourd, grapevine, nectarine, peach, potato, pricklypear and sugarcane.



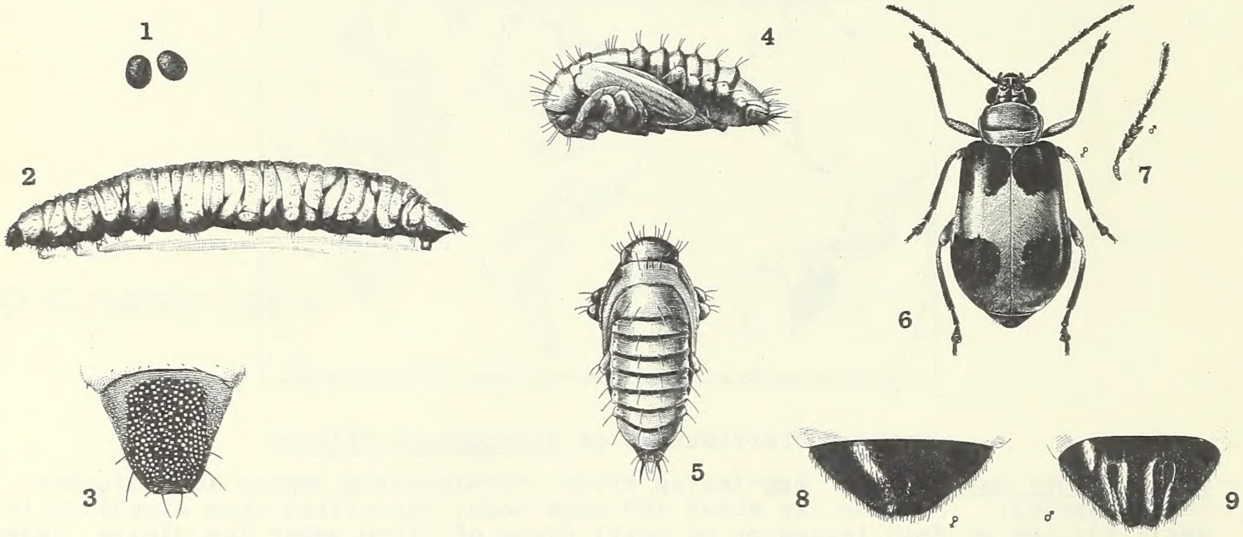
General Distribution of Aulacophora hilaris

Life History and Habits: Egg-laying after overwintering begins in September (early spring). Females lay about 490 eggs each, depositing them singly or in small batches on dead leaves or on small clods of earth under the plants. Eggs hatch in 8 to 10 days in summer, up to 23 days in cooler weather. Young larvae feed on roots or tunnel stems just above the ground, or fruits in contact with the soil. Larval and pupal development each takes approximately 18 to 20 days. Pupation occurs in the soil, 1 to 6 inches below the surface, in fragile, earthen cells. Several generations develop annually. The average period from egg to adult is 50 to 53 days. The adults attack plants in all stages of growth, but chief damage is caused to young plants, especially those just above the ground; these may be destroyed by half-a-dozen beetles in a few hours. In older crops individual plants may be destroyed, but are usually able to outgrow the infestation. The flowers and young fruits of pumpkins and squashes may be attacked, causing additional losses. The average life of the adult is 194 days for the female and 157 days for the male; however, they may live as long as one year. Normally, adults will hibernate during the winter under sheltered conditions such as bark of dead trees, hollow trees, etc. Overwintering does not occur in the larval or pupal stage.

(Chrysomelidae, Coleoptera)

No. 82 of Series

Description: ADULT - Elongate, broader posteriorly than anteriorly; female slightly larger than male. Color, bright orange with black markings. Each elytra marked with two prominent black patches, also sometimes slightly tipped with black. Terminal abdominal segment black, adjacent segment black except for small yellow band dorsally at each lateral margin. Eyes, tibiae and tarsi and ventral surface of each thoracic segment are dark-colored. Antennae dark except basal 5 segments in male, 2 basal in female, which are yellow. Antennae 11-segmented; simple in female, but 3rd to 5th basal segments enlarged in male. Abdomen 5-segmented. Terminal abdominal segment of male and female differ as illustrated. Length 7-8 mm. EGG - Bright orange when laid, later becomes paler, then yellowish-brown before hatching. Shell delicately reticulated. LARVA - Newly-hatched larva slender, light-brown in color. Mature larva 10-13 mm. long, yellowish-white to pale yellowish-brown. Head and thorax slightly narrower than abdomen. Head brown, antennae 3-segmented. Dorsal surface of prothorax shaded brown. Legs yellowish-brown, lightly bristled, tarsi with single claw. Anal shield of abdomen brown with numerous circular white pittings; four large pairs of setae on anal shield, first and third pairs clubbed, second and fourth aciculate; dorsoanteriorly to third pair of setae, pair of small papillae. Spiracles on second thoracic segment and each abdominal segment. PUPA - Generally resembles family characteristics. At first creamy white, later darkening. (Prepared in Survey and Detection Operations in cooperation with other ARS agencies). CEIR 9(15) 4-10-59.



Stages of pumpkin beetle (Aulacophora hilaris)

1. Egg. 2. Fully grown larvae. 3. Anal shield of larva, dorsal view.
4. Pupa, lateral view. 5. Pupa, dorsal view. 6. Female, dorsal view.
7. Male antenna. 8. Last abdominal segment of female, ventral view.
9. Last abdominal segment of male, ventral view.

Figures (except map) from Morgan, W. L., 1933. Agr. Gazette N. S. Wales 44(2): 811-815.

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